

Claims (for U. S. application)

1. A transmission for a work vehicle having PTO function, comprising:
  5. a first transmission shaft for receiving engine power through a PTO power train;
  - a second transmission shaft for receiving the engine power through a traveling power train, said second transmission shaft being coupled to a rear differential mechanism;
  - 10 a third transmission shaft coupled to a rear PTO;
  - a fourth transmission shaft for receiving force from the second transmission shaft;
  - a first gear transmission mechanism for transmitting the force from the first transmission shaft to the third transmission shaft;
  - 15 said first gear transmission mechanism including;
    - an input gear mounted on the first transmission shaft,
    - an output gear mounted on the third transmission shaft,

and

    - 20 a relay gear loosely mounted on the second transmission shaft for transmitting the force from the input gear to the output gear; and
    - a second gear transmission mechanism for transmitting the force from the second transmission shaft to the fourth transmission shaft;

said second gear transmission mechanism including;

    - 25 an input gear mounted on the second transmission shaft,
    - an output gear mounted on the fourth transmission shaft,

and

    - 30 a relay gear loosely mounted on the third transmission shaft for transmitting the force from the input gear to the output gear.

2. The transmission according to claim 1, wherein said

fourth transmission shaft comprises a front wheel transmission shaft for transmitting force to front wheels.

3. The transmission according to claim 1, further comprising:  
5           a mid PTO shaft; and  
              a third gear transmission mechanism for transmitting the force from the first gear transmission mechanism to the mid PTO shaft;  
              said third gear transmission mechanism including;  
              an output gear mounted on the mid PTO shaft,  
10           a first relay gear loosely mounted on the third transmission shaft for receiving the force from the first gear transmission mechanism, and  
              a second relay gear loosely mounted on the fourth transmission shaft and meshing with said first relay gear and said output gear.  
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4. The transmission according to claim 1, wherein said first transmission shaft mounts a PTO clutch.

20           5. The transmission according to claim 3, wherein further comprising a mid PTO clutch interposed between the third gear transmission mechanism and the mid PTO shaft.

25           6. The transmission according to claim 3, wherein said relay gear of the first gear transmission mechanism includes a gear portion meshing with the input gear of the first gear transmission mechanism, a further gear portion meshing with the output gear of the first gear transmission mechanism and a still further gear portion meshing with the first relay gear of the third gear transmission mechanism.